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respect to exact statistical research. Both these methods are indispensable. But it is well to remember that the sex problem was first attacked by such methods, and that they long gave inconclusive or wholly misleading results. The most fruitful suggestions for its solution were first given by morphological studies, in which minute cytological research has latterly played an important part, while the newer experimental work is bringing complete demonstration to these suggestions. It would be hard to find a better illustration of the futility of placing exclusive trust in any single method for the solution of any complex biological problem. If a definitive solution is to be attained it will be a result of the alliance between observation and experiment, between morphology and physiology, which is fortunately becoming the distinctive feature of modern zoology and botany.

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PROFESSOR ALFRED GIARD (1846-1908)

SCIENCE in France has suffered an untimely loss in the death of Professor Giard. He was stricken suddenly (d. August 8) while in the height of his activities, relatively young, keen in his interest in new biological tendencies. His influence had long been felt in the advancement of science; and his absence will be regretted not alone in his native country. He was one of the foremost naturalists of his day, a man of vast erudition, and of original views.

His bent for natural history showed itself from his earliest youth. As a child of six he was already a passionate observer of nature, helped and encouraged by his father, who found the time to scour with him the surrounding country, the streams, the woods, the moats of the fortifications of Valenciennes, his native town; in this way he began to lay up a store of valuable information by personal experience, and to acquire the veritable instruction and education which he himself recommends in an article, charming and pro-

found, published a few days before his death.¹ As attentive in reading and assimilating the writings of his predecessors as in observing all that took place around him, he early acquired a ripeness of judgment and a knowledge of facts noticeable in his very first writings, and particularly striking in his thesis for the degree of doctor.²

Appointed professor of natural history in Lille in 1873, Alfred Giard rapidly organized a zoological center and trained many remarkable naturalists, among others Charles, Jules and Théodore Barrois, P. Hallez, P. Pelseneer, L. Dollo. His profound knowledge of botany, as well as zoology, enabled him to teach both subjects with equal success. An enthusiastic convert to transformism, he introduced this doctrine into France by his teachings and writings, in spite of the most active opposition.

In 1874 he founded at Wimereux, near Boulogne (Pas-de-Calais), a zoological marine station; it was a tiny building with but scanty accommodation for the numerous and busy workers who rapidly assembled there, but it was destined to accomplish much useful work, as will be seen by its output—the *Bulletin Scientifique de la France et de la Belgique*, has now its forty-second volume in press, and there are eight volumes in quarto of *Travaux de la Station Zoologique de Wimereux*. There he passed his holidays living among his pupils in the most informal way, exploring with them the shore at low tide, the sand-hills surrounding the laboratory, the woods and highways farther afield, amazing all by the extreme variety of his knowledge and his wide-spread erudition, and opening to their eager eyes many unsuspected biological associations. It is only to be deplored that Giard's results on the fauna and flora of the region of the Boulogne, studies which extended over a period of twenty-four years, remain unpublished. At the time of his death he was gathering together his voluminous

¹ "Education du Morphologiste," *Revue du Mois*, 10 Juillet, 1908.

² "Recherches sur les Ascidies composées ou Synascidies," *Archives de Zoologie Expérimentale*, t. I., 1872.

notes and hoped to bring them out in a separate publication.

Giard stayed in Lille until 1887, when he accepted a call to Paris as professor in the École Normale Supérieure, and a year later the municipality created for him a professorship in the Sorbonne for the Évolution des Êtres organisés, which he occupied up to the time of his death.

In 1900 he was elected a member of the Academy of Sciences, and during the last few years several of the most important foreign academies had likewise admitted him to their ranks.

There was scarcely a contemporary naturalist who possessed in similar degree Giard's gift of interesting and attracting younger workers. His manner was cordial, happy, inspiring; his students felt that they could rely upon him, and he in turn guided their steps with the keenest interest, gave them his personal support in their career and rejoiced with them in their success. He was not only a master but a true and wise friend.

His science was eminently altruistic; he worked surrounded by his pupils, happy to see them continue and complete discoveries which he had already outlined. His faculty of observation drew his attention to what might prove interesting in many branches. In almost every group he found material for study, and his works consisted chiefly of short papers, results of personal investigations, full of original and suggestive ideas. Nearly every aspect of biology was touched upon—systematic zoology, anatomy, embryology, etiology, comparative pathology, teratology, applied zoology, botany, zoological philosophy. His papers are dispersed among a multitude of periodicals, and it would be a difficult task to collect them had there not been published the usual complete bibliography and résumé (1896) when he was admitted to the Academy of Sciences.³

I will mention only a few of Giard's most important results: such, for example, are his numerous researches on parasitism, during

³ "Exposé des titres and travaux scientifiques (1869-96) d'Alfred Giard," Paris, 1896, in quarto, 396 pp.

which he discovered many very curious types, *e. g.*, the orthonectida, also an admirable series of papers in collaboration with Jules Bonnier on the epicarides, the isopodous parasites of crustacea. His synthetic genius, combined with minute observation and rare erudition, enabled him to seize and combine ideas and facts which would otherwise seem to have no connection, and he introduced into general biology new and important ideas founded on well-proved experiences. For instance, the action of water and the phenomena of *anhydrobiosis*, the curious modifications produced by parasites on their hosts, *e. g.*, in cases of castration by parasites, and the interesting variations of development of individuals of the same species or closely approaching species which he called appropriately pœcilogony.

Giard was one of the few naturalists who had the gift of being both original and encyclopedic. He possessed in an unusual degree a knowledge of infinite details of nature and of general philosophy, as one can judge indeed from the lecture he delivered at St. Louis in 1904.⁴

His brilliant intellect and prodigious memory enabled him to retain the quantity of material contained in his wide-spread readings, so that he was really a living encyclopedia and always up to date, opening immediately at the page wanted, to be examined at leisure by all who desired to acquire knowledge.

All these qualities remained unobscured to the last day of his life, and his loss is felt as an untimely one to all who came in touch with his many activities.

It is as though a torch carried before the crowd to light the way had been too soon extinguished.

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SCIENTIFIC NOTES AND NEWS

DR. DAVID STARR JORDAN, president of Stanford University, has been elected president of the American Association for the Advancement of Science for the meeting to be held

⁴ "Les tendances actuelles de la morphologie et ses rapports avec les autres sciences."